

# Southeast Michigan Council of Governments State of the art Traffic Count Program

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*Senior Transportation Planner*

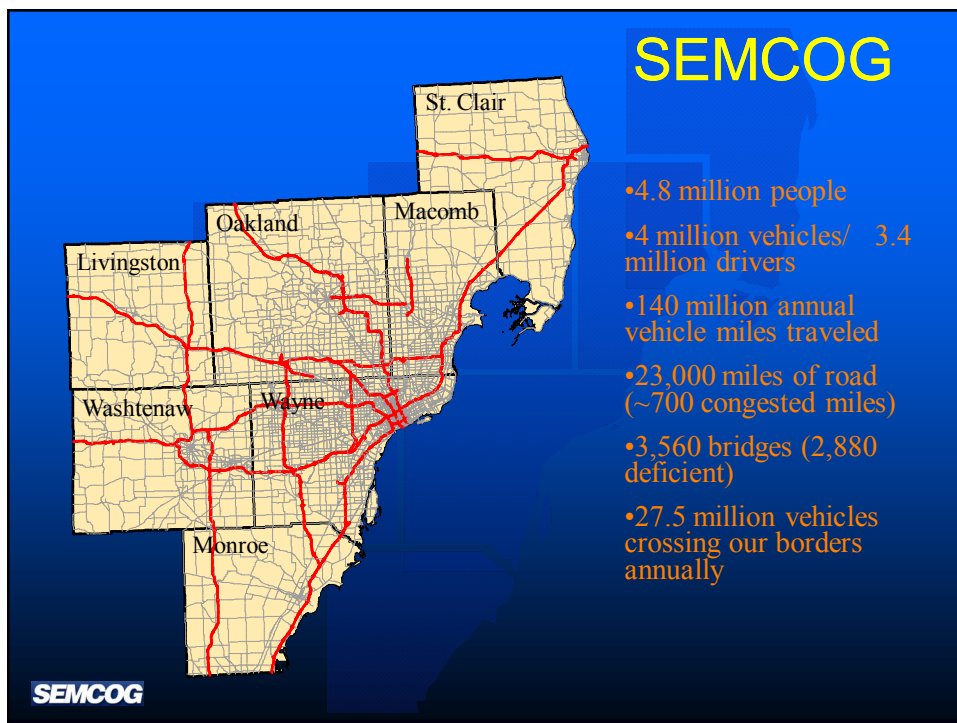
*Southeast Michigan Council of Governments*

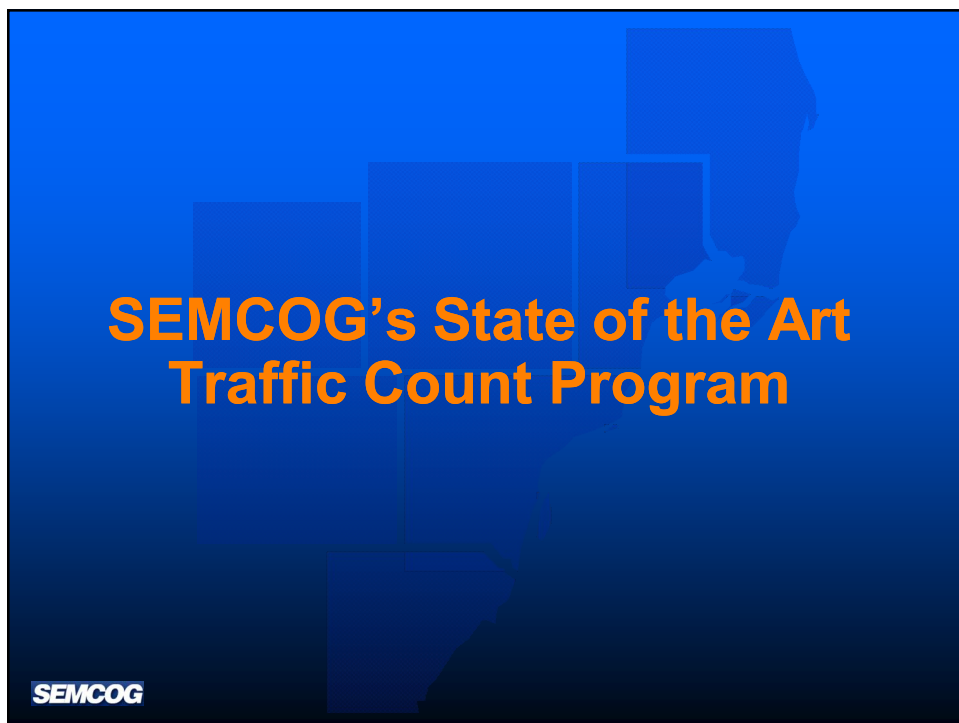
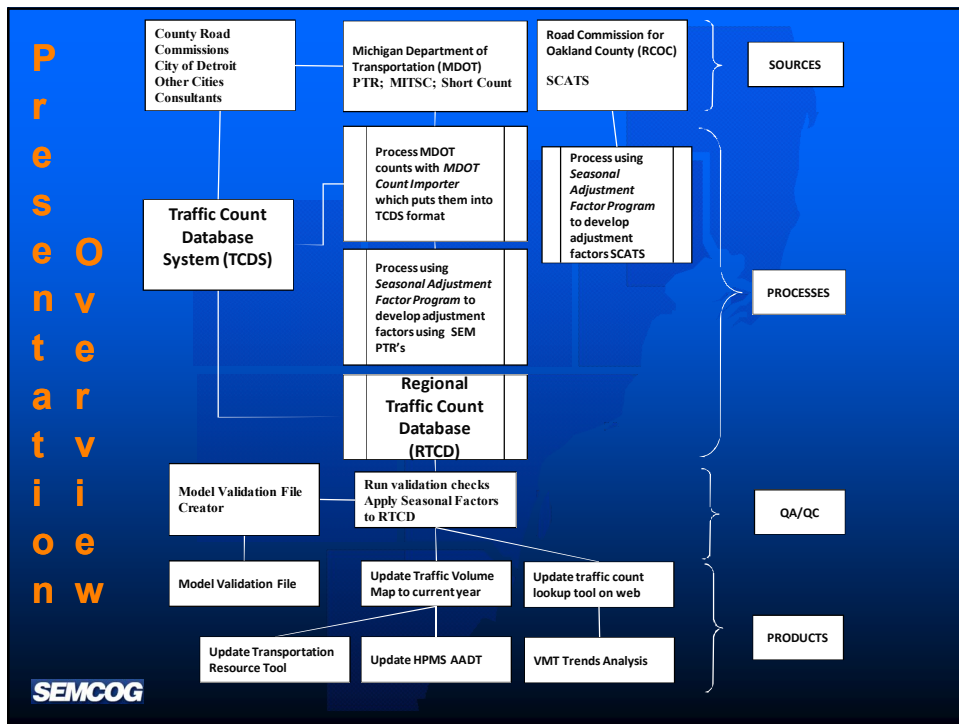
*Travel Model Improvement Program*

*Webinar*

*Thursday, April 29, 2010*

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## Challenges

- No consistency in count data format
- No central database for storing counts
- No efficient procedure for linking counts with model
- No way to determine if counts sufficient for validation

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## Solutions

- Create regional traffic count database (RTCD)
  - Central repository for all counts
  - Source of counts for model, other apps
- Create automated procedure for linking counts with model
- Use power of GIS (linear referencing)

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## RTCD Development Issues

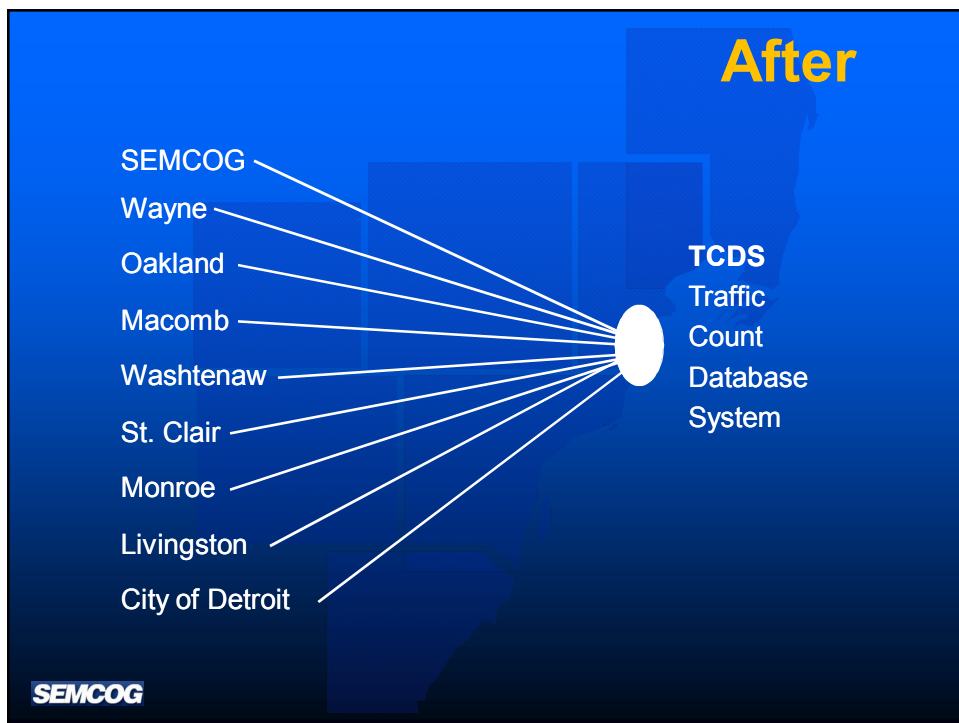
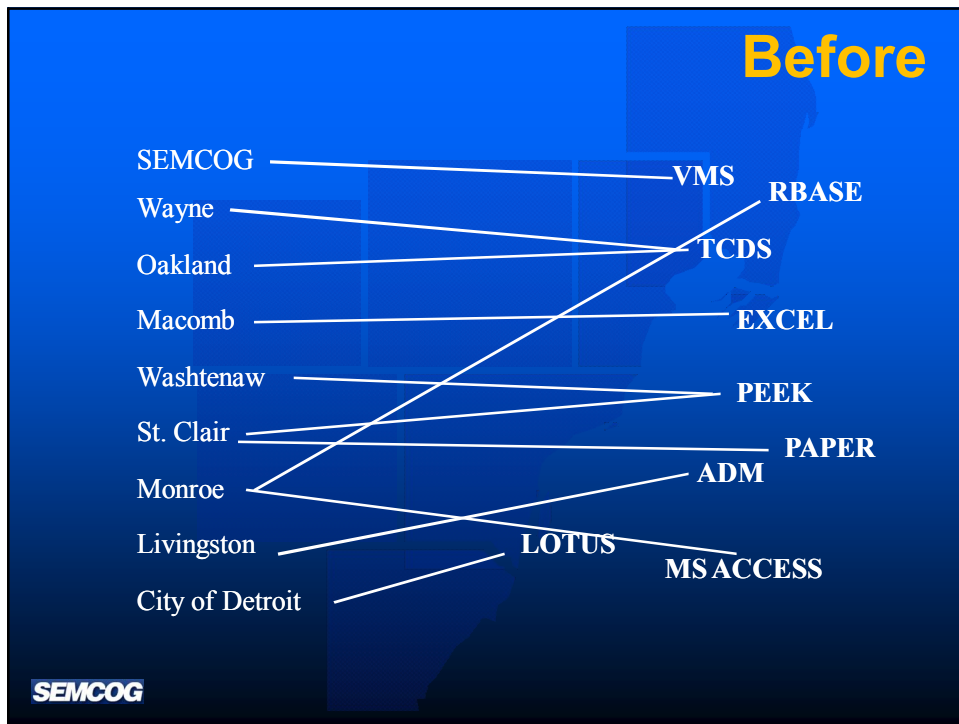
- Transferring data from multiple sources into common format
  - Michigan Department of Transportation (MDOT)
  - Local agencies (counties, cities)
- Developing RTCD database structure
- Coding counts with GIS attributes

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## Traffic Count Database System (TCDS)

- Software features
  - Web-based, friendly user interface
  - Direct uploading from traffic counters
  - Logical relational database structure
  - QA/QC Numerous quality control measures
- Provides SEMCOG easy access to counts from all seven counties, Detroit

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## SEMCOG's Regional Traffic Count Database (RTCD)

- Oracle database with three primary tables:
  - Count location descriptions
  - Counts
  - GIS (linear referencing) coding
- Number of records in database
  - Locations: 29,647
  - Total counts available: 96,849

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## Importing MDOT's Traffic Count Data

- Challenges
  - Understanding MDOT's count program
  - Three types of data: PTR, ITS, short counts
  - Different data format for each type
- Solution: MDOT data conversion tool
  - Converts all data into common format
  - Flags “representative” PTR, ITS counts

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# MDOT Data Conversion Tool

SEMCOG Import from MDOT Process

## MDOT Import Menu

Select Short Count Table:

Select MITS Count Table:

Select PTR Count Table:

### Random Count Selection

### Create TCDS Tables

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# Seasonal Factor Development

Seasonal Factors  
By Year  
By Month  
By Day of Week

AADT  
AWDT

Group 1								
Functional Class -								
From Year: 2008		To Year: 2008						
	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Month
Jan	1.84	1.06	1.04	0.94	0.96	0.91	1.31	1.06
Feb	1.78	1.04	1.03	0.97	0.99	1.01	1.31	1.08
Mar	1.82	1.05	1.01	1.00	0.95	0.98	1.29	1.07
Apr	1.60	0.95	0.92	0.91	0.91	0.90	1.20	0.99
May	1.62	1.02	0.90	0.91	0.90	0.89	1.21	0.99
Jun	1.53	0.92	0.91	0.91	0.91	0.88	1.22	0.98
Jul	1.65	0.97	0.94	0.91	0.91	1.02	1.39	1.04
Aug	1.62	0.94	0.91	0.92	0.92	0.91	1.30	1.01
Sep	1.63	1.01	0.90	0.90	0.88	0.89	1.26	0.99
Oct	1.54	0.96	0.90	0.91	0.86	0.86	1.21	0.97
Nov	1.68	0.96	0.93	0.93	1.03	1.00	1.35	1.04
Dec	1.60	0.96	0.98	0.97	1.02	1.05	1.29	1.06

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# Traffic Count Database System (TCDS)

SEMOG

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**SEMOG** Transportation Data Management System

TCDS | TSMS | TCLS | TIDS | PMS | PMDS | RSMS | PCDS | PMMS | WOTS | RTIV

Login

OPTION 1 - SEARCH BY MAP [open map](#) [auto-locate OFF](#)

Use the Map Tools to zoom to an area. Then click a marker or Select by Polygon to review locations and counts. Markers may not show up until zooming in closer.

OPTION 2 - SEARCH BY DATA - TCDS

Select search criteria below, then click the "Search" button.

County	ALL	
Community	- Select Community -	
Location ID	<input checked="" type="radio"/> Exact Match <input type="radio"/> Starts With <input type="radio"/> Ends With	
Type	ALL	
Located On <sup>1</sup>	<input type="text"/>	<input type="checkbox"/> Exact Match
Route Type	ALL	
Route	<input type="text"/>	<input type="checkbox"/> Exact Match
<a href="#">Less Detail</a>		
Crossroad <sup>1</sup>	ALL	<input type="checkbox"/> Exact Match
From Road <sup>1</sup>	<input type="text"/>	<input type="checkbox"/> Exact Match
To Road <sup>1</sup>	<input type="text"/>	<input type="checkbox"/> Exact Match
Jurisdiction	ALL	
HPMS	<input type="text"/>	
Screenline ID	ALL	
Geocoded?	ALL	
Perm Station?	ALL	
WIM Station?	ALL	
Direction	ALL	
Funct'l Class	ALL	
Study	ALL	
Volume	Min # <input type="text"/> Max # <input type="text"/> OR Select Year: ALL <input type="text"/>	

Most recent Volume & ADT count (e.g., 6000) (Searches ADT Year too)

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### SEMOG Transportation Data Management System

Home | TMS | TCS | TDS | PMS | PMDS | RSM | PCDS | PMMS | WOTS | RTTY

Login | Locate | Locate All

open map auto-locate OFF

List View All DIRs All Approaches Build Search

Record 240 of 511 Goto Record go

Location ID	7187	MPO ID	28654
Type	SPOT	HPMS ID	
SF Group	01	Route Type	
AF Group		Route	
Funct Class	-		
Located On	12 Mile		
AT	FARMINGTON		
County	Oakland	Lanes	
Community	Farmington Hills	Surface Type	
Jurisdiction		Category	HPMS
Screenline IDs		Latitude	42.498642
Perm Station	No	Longitude	-83.379042
WIM Station	No	Speed Limit	

Directions: EB

Year	AAADT	DHV-30	K %	D %	PA	BC	Src
2010	15,060						
2008	16,460						
2004	16,510						

Travel Demand Model

Model Year	Model AADT	AM PHV	AM PPV	MD PHV	MD PPV	PM PHV	PM PPV	NT PHV	NT PPV
2010									
2008									
2004									

VOLUME COUNT

Date	Int	24-Hr Total
Wed 3/17/2010	60	15,933
Mon 5/12/2008	60	16,566
Tue 9/14/2004	60	18,349

VOLUME TREND

Year	Annual Growth
2010	-4%
2008	0%

SPEED

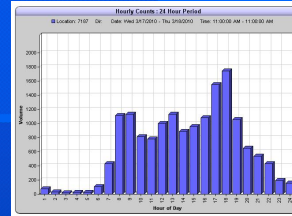
Date	Int	Pace	85th	Total

CLASSIFICATION

Date	Int	Total

WEIGHT-IN-MOTION

Date	Int	Total



### SEMOG Transportation Data Management System

Home | TMS | TCS | TDS | PMS | PMDS | RSM | PCDS | PMMS | WOTS | RTTY

back | Login | Locate | Locate All

open map auto-locate OFF

LOCATION ID 7187  
TYPE SPOT  
LOCATED ON 12 Mile  
DIRECTION EB  
COMMUNITY Farmington  
PERIOD 3/15/2010 - 3/15/2010

Start Time	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Avg	graph
12:00 AM	73	32	32	32	32	32	32	73	
1:00 AM	16	16	16	16	16	16	16	16	
2:00 AM	27	27	27	27	27	27	27	27	
3:00 AM	28	28	28	28	28	28	28	28	
4:00 AM	305	305	305	305	305	305	305	305	
5:00 AM	429	429	429	429	429	429	429	429	
6:00 AM	1113	1113	1113	1113	1113	1113	1113	1113	
7:00 AM	1133	1133	1133	1133	1133	1133	1133	1133	
8:00 AM	810	810	810	810	810	810	810	810	
9:00 AM	782	782	782	782	782	782	782	782	
10:00 AM	1003	1003	1003	1003	1003	1003	1003	1003	
11:00 AM	1129	1129	1129	1129	1129	1129	1129	1129	
12:00 PM	888	888	888	888	888	888	888	888	
1:00 PM	951	951	951	951	951	951	951	951	
2:00 PM	1092	1092	1092	1092	1092	1092	1092	1092	
3:00 PM	1053	1053	1053	1053	1053	1053	1053	1053	
4:00 PM	1744	1744	1744	1744	1744	1744	1744	1744	
5:00 PM	1055	1055	1055	1055	1055	1055	1055	1055	
6:00 PM	951	951	951	951	951	951	951	951	
7:00 PM	539	539	539	539	539	539	539	539	
8:00 PM	432	432	432	432	432	432	432	432	
9:00 PM	195	195	195	195	195	195	195	195	
10:00 PM	359	359	359	359	359	359	359	359	
11:00 PM	787	787	787	787	787	787	787	787	
Total	0	0	11,345	4,548	0	0	0	7,897	
24-Hr Total			15933					15,933	

### SEMOG Transportation Data Management System

Home | TMS | TCS | TDS | PMS | PMDS | RSM | PCDS | PMMS | WOTS | RTTY

Login | Locate | Locate All

open map auto-locate ON

List View All DIRs All Approaches Build Search

Record 1 of 134 Goto Record go

Location ID	111	MPO ID	19552
Type	SPOT	HPMS ID	
SF Group	01	Route Type	
AF Group		Route	
Funct Class			
Located On	SEYMOUR LAKE		
AT	SASHABAW		
County	Oakland	Lanes	
Community	Brandon Twp	Surface Type	
Jurisdiction		Category	
Screenline IDs		Latitude	42.808775
Perm Station	No	Longitude	-83.374279
WIM Station	No	Speed Limit	55

Directions: EB

Year	AAADT	DHV-30	K %	D %	PA	BC	Src
2010	3,410						
2008	4,100						
2005	5,240						
2003	3,520						
1999	3,520						

Travel Demand Model

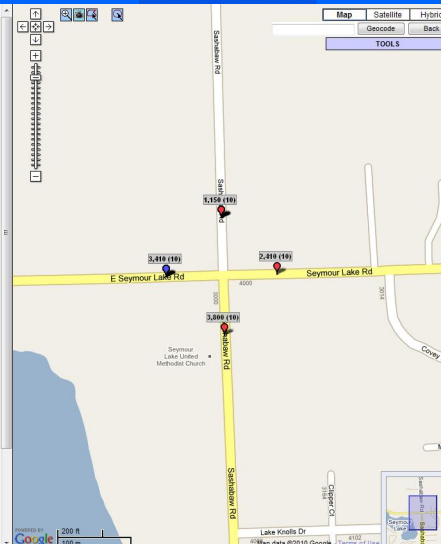
Model Year	Model AADT	AM PHV	AM PPV	MD PHV	MD PPV	PM PHV	PM PPV	NT PHV	NT PPV
2010									
2008									
2005									
2003									
1999									

VOLUME COUNT

Date	Int	24-Hr Total
Mon 4/12/2010	60	3,581
Mon 8/15/2008	60	4,247
Tue 6/6/2006	60	5,787
Tue 12/2/2003	60	3,548
Wed 4/28/1999	60	3,587

VOLUME TREND

Year	Annual Growth
2010	-9%
2008	-12%
2006	14%
2003	2%



# SCATS Traffic Signal System

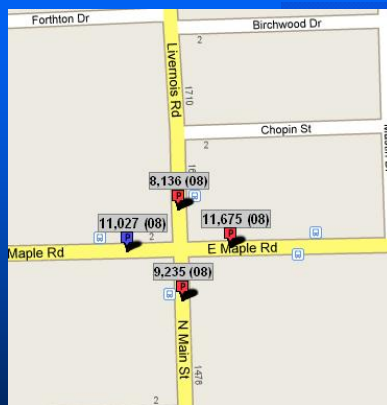


- Traffic Count Data
  - By approach
  - By lane
  - Back logged to 2006



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# SCATS Traffic Signal System



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# SCATS Traffic Signal System

Record 2 of 2185 Goto Record 25

Location ID 10\_NB Edit Restore Previous MPO ID

Type SPOT HPMS ID

SF Group 1 Route Type

AF Group

Funct Class

Located On LIVERNOIS

SOUTH OF MAPLE

County Oakland

Community

Jurisdiction

Screenline ID Edit Screenline IDs Surface Type

Category SCATS

Latitude 42.547811

Longitude -83.145977

Perm Station Yes

Speed Limit

WMM Station No

Directions NB SB

AADT

Year	AADT	SBV-30	K %	D %	PA	BC	Sts
2010	8,409						
2009	8,543						
2008	9,239	871	9				
2007	10,244	1,109	11				
2006	10,401	1,119	11				

Travel Demand Model

Model Year

AADT

AM PMV AM PMV MD PMV MD PMV PM PMV PM PMV NT PMV NT PMV

VOLUME COUNT

Date

Mon 4/26/2010 15 9,479

Sun 4/25/2010 15 5,066

Sat 4/24/2010 15 6,969

Fri 4/23/2010 15 10,427

Thu 4/22/2010 15 9,960

Wed 4/21/2010 15 10,135

Tue 4/20/2010 15 9,816

Mon 4/19/2010 15 9,558

Sun 4/18/2010 15 5,342

Sat 4/17/2010 15 7,085

VOLUME TREND

Year

2010 -2%

2009 -7%

2008 -10%

2007 -2%

Jump to Date 1-10 of 1110 (MMDDYYYY)

•Location Information

•Volume Counts

•AADT

•Volume Trends

SEMCOG

# SCATS Traffic Signal System

Record 2 of 2185 Goto Record 25

Location ID 10\_NB Edit Restore Previous MPO ID

Type SPOT HPMS ID

SF Group 10\_1\_NB Route Type

AF Group

Funct Class

Located On LIVERNOIS

SOUTH OF MAPLE

County Oakland

Community

Jurisdiction

Screenline ID Edit Screenline IDs Surface Type

Category SCATS

Latitude 42.547811

Longitude -83.145977

Perm Station Yes

Speed Limit

WMM Station No

Directions NB SB

AADT

Year	AADT	SBV-30	K %	D %	PA	BC	Sts
2010	1,482						
2009	1,724						
2008	2,045	331	16				

Travel Demand Model

Model Year

AADT

AM PMV AM PMV MD PMV MD PMV PM PMV PM PMV NT PMV NT PMV

VOLUME COUNT

Date

Mon 4/26/2010 15 1,818

Sun 4/25/2010 15 179

Sat 4/24/2010 15 1,255

Fri 4/23/2010 15 2,165

Thu 4/22/2010 15 1,779

Wed 4/21/2010 15 1,904

Tue 4/20/2010 15 1,773

Mon 4/19/2010 15 1,958

Sun 4/18/2010 15 479

Sat 4/17/2010 15 1,275

VOLUME TREND

Year

2010 -14%

2009 -10%

2008 -12%

2007 9%

Jump to Date 1-10 of 1161 (MMDDYYYY)

Record 2 of 2185 Goto Record 25

Location ID 10\_NB Edit Restore Previous MPO ID

Type SPOT HPMS ID

SF Group 10\_2\_NB Route Type

AF Group

Funct Class

Located On LIVERNOIS

SOUTH OF MAPLE

County Oakland

Community

Jurisdiction

Screenline ID Edit Screenline IDs Surface Type

Category SCATS

Latitude 42.547811

Longitude -83.145977

Perm Station Yes

Speed Limit

WMM Station No

Directions NB SB

AADT

Year	AADT	SBV-30	K %	D %	PA	BC	Sts
2010	3,380						
2009	3,314						
2008	3,498	352	10				

Travel Demand Model

Model Year

AADT

AM PMV AM PMV MD PMV MD PMV PM PMV PM PMV NT PMV NT PMV

VOLUME COUNT

Date

Mon 4/26/2010 15 3,843

Sun 4/25/2010 15 2,099

Sat 4/24/2010 15 2,788

Fri 4/23/2010 15 4,120

Thu 4/22/2010 15 4,075

Wed 4/21/2010 15 4,074

Tue 4/20/2010 15 3,843

Mon 4/19/2010 15 3,862

Sun 4/18/2010 15 2,217

Sat 4/17/2010 15 2,803

VOLUME TREND

Year

2010 2%

2009 6%

2008 -19%

2007 5%

Jump to Date 1-10 of 1161 (MMDDYYYY)

Record 2 of 2185 Goto Record 25

Location ID 10\_NB Edit Restore Previous MPO ID

Type SPOT HPMS ID

SF Group 10\_3\_NB Route Type

AF Group

Funct Class

Located On LIVERNOIS

SOUTH OF MAPLE

County Oakland

Community

Jurisdiction

Screenline ID Edit Screenline IDs Surface Type

Category SCATS

Latitude 42.547811

Longitude -83.145977

Perm Station Yes

Speed Limit

WMM Station No

Directions NB SB

AADT

Year	AADT	SBV-30	K %	D %	PA	BC	Sts
2010	3,385						
2009	3,345						
2008	3,488	360	10				

Travel Demand Model

Model Year

AADT

AM PMV AM PMV MD PMV MD PMV PM PMV PM PMV NT PMV NT PMV

VOLUME COUNT

Date

Mon 4/26/2010 15 3,818

Sun 4/25/2010 15 2,072

Sat 4/24/2010 15 2,820

Fri 4/23/2010 15 4,142

Thu 4/22/2010 15 4,105

Wed 4/21/2010 15 4,157

Tue 4/20/2010 15 4,100

Mon 4/19/2010 15 3,838

Sun 4/18/2010 15 2,249

Sat 4/17/2010 15 2,866

VOLUME TREND

Year

2010 1%

2009 -3%

2008 -3%

2007 -16%

Jump to Date 1-10 of 1161 (MMDDYYYY)

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# AADT

•AADT

Record	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Location ID	10.45										Code Record										MPO ID										HRS ID										Route Type										Route																																																	
Type	SPOT										Lanes										Surface Type										Category										SCATS																																																											
Group	1										Lanes										Surface Type										Category										SCATS																																																											
Facility Class	1										Lanes										Surface Type										Category										SCATS																																																											
Located On	MAPLE										Lanes										Surface Type										Category										SCATS																																																											
County	WEST OF LIVERPOOL										Lanes										Surface Type										Category										SCATS																																																											
Community	Oakland										Lanes										Surface Type										Category										SCATS																																																											
Jurisdiction	Oakland										Lanes										Surface Type										Category										SCATS																																																											
Screenline	10										Lanes										Surface Type										Category										SCATS																																																											
Permit Station	Yes										Lanes										Surface Type										Category										SCATS																																																											
Directions	10										Lanes										Surface Type										Category										SCATS																																																											
AADT	Year										AADT										DHV-30										K %										D %										PA										BC										Src																													
	2008										11,027										1,200										11																																																																					
	2007										12,324										1,464										12																																																																					
	2006										12,577										1,511										12																																																																					

Directions: EB 1 2 3

Year	AADT	DHV-30	K %	D %	PA	BC	Src
2008	2,402	493	21				
2007	2,385	332	14				

Directions: EB 1 2 3

Year	AADT	DHV-30	K %	D %	PA	BC	Src
2008	4,382	573	13				
2007	5,245	659	13				

Directions: EB 1 2 3

Year	AADT	DHV-30	K %	D %	PA	BC	Src
2008	3,967	479	12				
2007	4,680	542	12				

Directions: EB 1 2 3

Year	AADT	DHV-30	K %	D %	PA	BC	Src
2008	11,027	1,200	11				
2007	12,324	1,464	12				
2006	12,577	1,511	12				

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# AADT

Seasonal Factors  
by Month  
by Day of Week

Group	1							
Functional Class	-							
From Year:	2008				To Year:	2008		
	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Month
Jan	1.84	1.06	1.04	0.94	0.96	0.91	1.31	1.06
Feb	1.78	1.04	1.03	0.97	0.99	1.01	1.31	1.08
Mar	1.82	1.05	1.01	1.00	0.95	0.98	1.29	1.07
Apr	1.60	0.95	0.92	0.91	0.91	0.90	1.20	0.99
May	1.62	1.02	0.90	0.91	0.90	0.89	1.21	0.99
Jun	1.53	0.92	0.91	0.91	0.91	0.88	1.22	0.98
Jul	1.65	0.97	0.94	0.91	0.91	1.02	1.39	1.04
Aug	1.62	0.94	0.91	0.92	0.92	0.91	1.30	1.01
Sep	1.63	1.01	0.90	0.90	0.88	0.89	1.26	0.99
Oct	1.54	0.96	0.90	0.91	0.86	0.86	1.21	0.97
Nov	1.68	0.96	0.93	0.93	1.03	1.00	1.35	1.04
Dec	1.60	0.96	0.98	0.97	1.02	1.05	1.29	1.06

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## Model Validation

SEMCOG

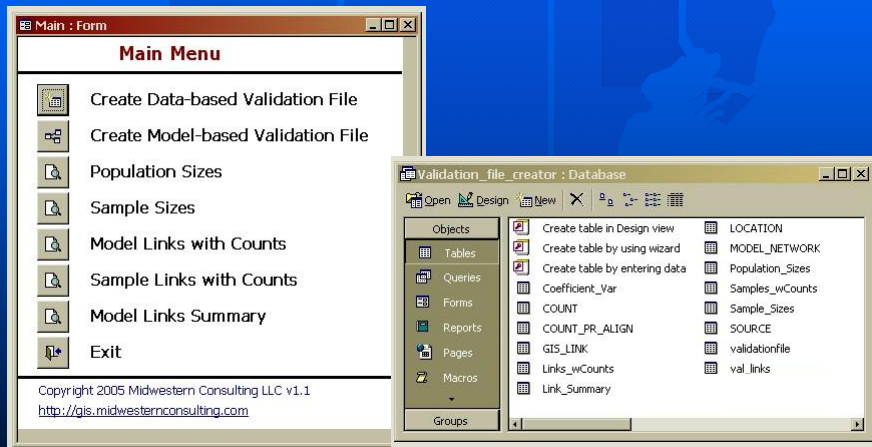
## Model Validation File Creator

- Purpose of Program
  - Choose Best Count
  - Counts Needed
- Business Rules
  - Closest date to validation year
  - 15 min over 60 min
  - Directional over two way
  - Shortest Distance Away from center of model link

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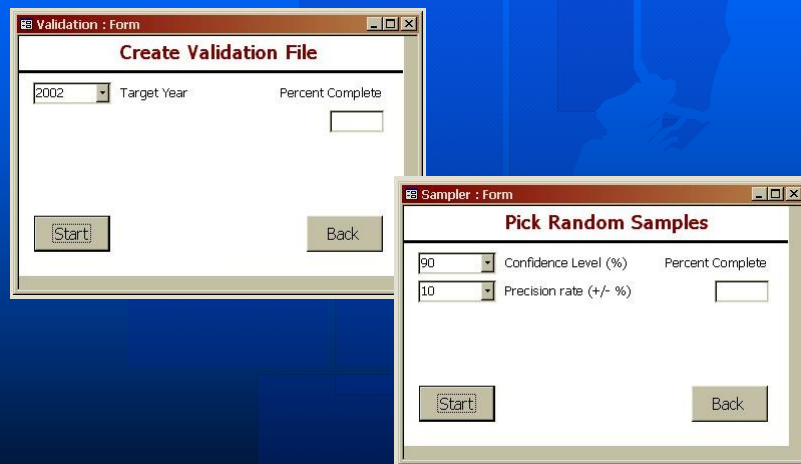


# Model Validation File Creator



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# Model Validation File Creator



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A blue-toned map of the Southeastern Michigan region, showing the outlines of Wayne, Oakland, and Macquinn counties. The map is semi-transparent, allowing the text and logo to be visible through it.

## Other Products and Analysis

**SEMCOG**

A blue-toned map of the Southeastern Michigan region, showing the outlines of Wayne, Oakland, and Macquinn counties. The map is semi-transparent, allowing the text and logo to be visible through it.

## Other TCDS Applications

- HPMS volume updates
- Traffic Volume Map
- SEMCOG's Transportation Data Map
- VMT Trends Analysis

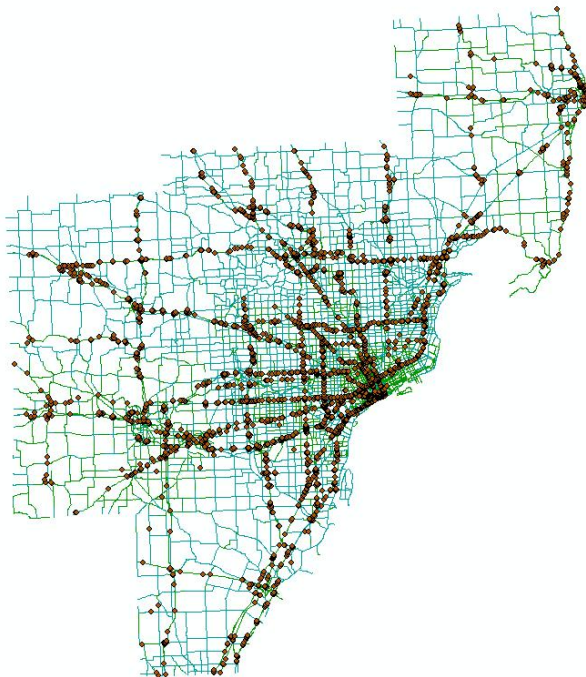
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## HPMS Volume Update

- HPMS volume updates
  - Using TCDS communities know what HPMS samples need to be counted.
  - Direct link from TCDS to HPMS database

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T  
r V  
a o  
f l  
f u M  
i m a  
c e p



SEMCOG

# Transportation Data Map

- SEMCOG's Transportation Data Map
  - Public access to all counts SEMCOG collects.
  - Both can search using a map or using a search tool.
  - Cuts down on traffic count requests from the public.
  - [WWW.SEMCOG.ORG](http://WWW.SEMCOG.ORG)

**SEMCOG**

**SEMCOG** ... Equipping local government leaders for the future

Find addresses, intersections, places of interest

**Transportation Data**

Zoom in and click on roads to obtain more information. Display additional map layers by checking the boxes below. The map legend is shown by clicking on the layer name.

- ☐ Bridges
- ☐ Transportation Projects
- ☐ Intersections [View](#)
  - ☒ Crash Frequency
  - ☐ Major and Minor
- ☐ Corridor Priorities
  - ☐ Regional
  - ☐ Safety
  - ☐ Pavement
  - ☐ Bridges
  - ☐ Congestion
- ☐ Municipal Boundaries
- ☐ Environmental Sensitivity
- ☐ Land Use / Land Cover
- ☐ Current Freeway Traffic [View](#)

**Complete Segment Information**

**SEMCOG Road Segment Report** [Open in new window to Print](#)

Old US 23 Hwy from Faussett Rd to Center Rd  
PR 932204 from mile point 20.007 to mile point 22.063

Community: Tyrone Twp  
County: Livingston  
Functional Class: 7 - Rural Major Collector

<b>Directions:</b>	Two-way traffic	<b>Short-Range Projects</b>	No TIP projects for this segment.
<b>Length:</b>	2.056 miles	<b>Long-Range Projects</b>	No RTP projects for this segment.
<b>Number Lanes, 2007:</b>	2		
<b>Posted Speed:</b>	55 (Source:TCO)		
<b>Route Classification:</b>	Not a route		
<b>Traffic Crashes, 2008:</b>	3		
<b>Traffic Volume, 2008:</b>	2,400 (Observed ADT)		
	ADT values are derived from <a href="#">Traffic Counts</a> .		
<b>Pavement Type, 2007:</b>	Asphalt		
<b>Pavement Rating, 2007:</b>	Poor		
<b>Pavement Rating, 2006:</b>	Poor		

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## Regional VMT Trends

- Evaluate economic impact on the traffic
- Verify HPMS estimation
- Calibrate the travel model

**SEMOG**

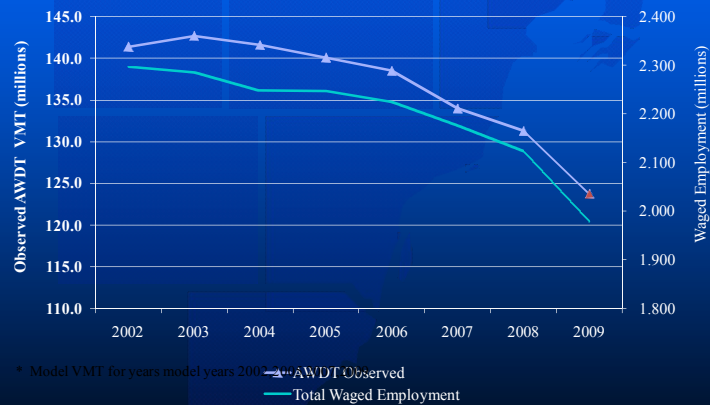
## Regional VMT Trends

- Using travel model as a benchmark to expand the RTCD annual counts to the region
- Using volume difference between model and counts to estimate regional VMT
- Results were weighed by county and facility type

**SEMOG**

## Regional VMT Trends

### Southeast Michigan Observed VMT and Employment



SEMCOG

## 2010 Data Collection Initiatives

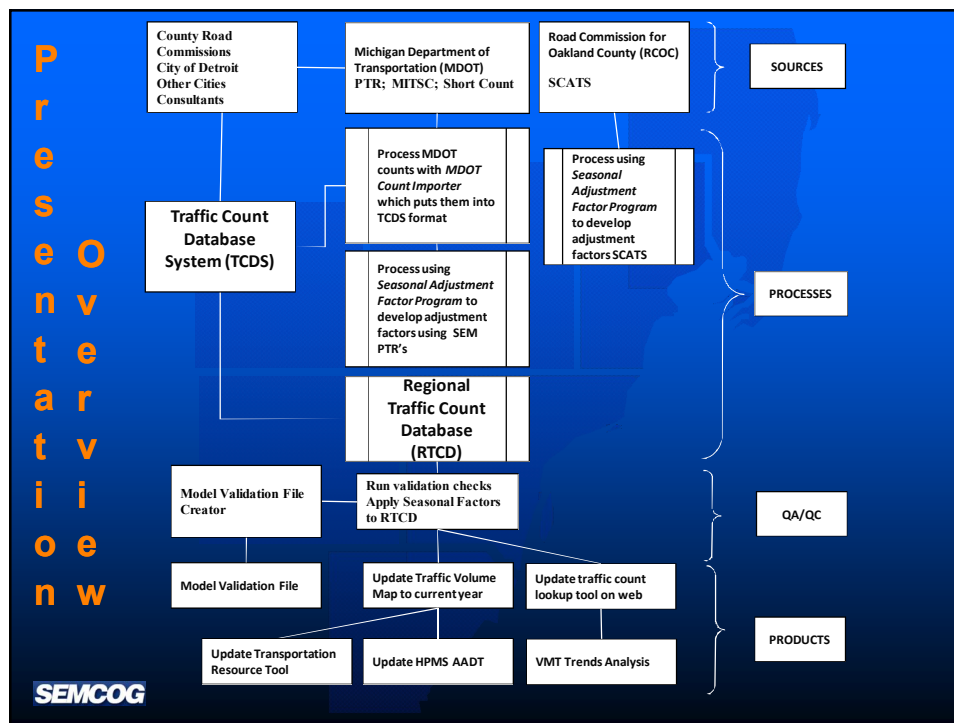
- Cutline
- External Station
- Corridor Counts
- HPMS universe data

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## Final Notes

- Establishing data formatting consistency
- Effective communication, coordination with local agencies and MDOT
- Establishing data quality controls throughout process
- Finding innovative ways to collect count data (SCATS signals)
- Automating tasks wherever possible

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*Travel Model Improvement Program*  
*Webinar*  
*Thursday, April 29, 2010*

